INTERNET SERVICE TELEPHONE COMMUNICATION CONNECTION
METHOD

BACKGROUND OF THE INVENTION

The present invention relates to an internet

5   communication system or an internet service telephone

communication method, and more particularly to a

telephone system through an internet telephone by a

provider on a calling side.

Japanese Patent Laid-Open No. No. 10-322391

10 discloses an example of the prior art internet service

telephone communication connection method. In the

disclosed communication terminal and communication

method, when a calling terminal intends to make internet

service communication, it sends out data including its

15 own IP address in the internet service network via a

separate line. A called terminal receiving the data

including the IP address sent out from the calling

terminal, connects itself to the internet service

network, and the calling terminal also connects itself

20 thereto. Thus, terminal-to-terminal communication is

made possible.

In the prior art, an internet service telephone set

is connected to the own access point of its own subscribed

internet service provider network to obtain the service

25 with internet service telephone software annexed to a

personal computer. However, the prior art internet

service telephone communication has the following

problems.

1

In the above prior art example, the internet service providers, which the calling and called sides are subscribers of, are indefinite. Therefore, it is impossible to ensure a sufficient service quality.

5   In order to secure sufficient internet service telephone communication quality, both the calling and called sides may be interconnected via the same internet service provider network. In this case, it is possible to reduce the service quality deterioration due to

10   different internet service providers. However, where each terminal as opposite side of communication is a subscriber of a peculiar provider, it is necessary to conclude contracts with a plurality of different providers. Consequently, the contract expenditures are

15   increased. This is undesired from the standpoint of reducing the internet service telephone communication exepditures.

SUMMARY OF THE INVENTION

An object of the present invention is to provide

20   an internet service telephone set capable of providing internet service telephone communication via the same internet service provider network.

According to a first aspect of the present invention, there is provided a telephone communication

25   system comprising a public network, an internet service provider network and a plurality of telephone sets accommodated in the public network, wherein when a calling telephone set as an internet service provider

network subscriber provides connection point data for making internet service telephone communication to a called telephone set via a public network, the called telephone set receiving the connection point data

5   connects itself to an internet service provider network according to the connection point data, and then the calling telephone set connects itself to the internet service provider network.

According to a second aspect of the present

10   invention, there is provided a telephone communication system comprising a public network, an internet service provider network and a plurality of telephone sets accommodated in the public network, wherein when a calling telephone set as an internet service provider

15   network subscriber provides connection point data for making internet service telephone communication to a called telephone set via a public network, the called telephone set receiving the connection point data connects itself to an internet service provider network

20   according to the connection point data, and then the calling telephone set connects itself to the internet service provider network, the connection point data including at least an IP address in the internet service provider network and the telephone number of a point to

25   be connected to the internet service provider network.

According to a third aspect of the present invention, there is provided a telephone communication system comprising a public network, an internet service

3

provider network and a plurality of telephone sets
accommodated in the public network, wherein when a
calling telephone set as an internet service provider
network subscriber provides connection point data for
5   making internet service telephone communication to a
called telephone set via a public network, the called
telephone set receiving the connection point data
connects itself to an internet service provider network
according to the connection point data, and then the
10   calling telephone set connects itself to the internet
service provider network, the connection point data
including at least an IP address in the internet service
provider network and the telephone number of a point to
be connected to the internet service provider network,
15   a push-button telephone set having various function keys
being provided between each of the plurality of telephone
sets and the public network with a function of sending
out a call from each telephone set.

       The functions of each telephone set are executed
20   on a personal computer. The functions of each telephone
set are executed with an IVR (interactive voice response
unit or a facsimile data server or a voice recognition
dialer or a voice mail.

       The telephone set comprises: a ten-key unit having
25   dial keys and a function key for indicating an internet
telephone service; a display unit for displaying a call
arrival notification and results of various processes
in the telephone set; an accumulating unit for storing

4

telephone number data and access identifier data of internet connection points to be connected by the calling and called sides; a voice codec to be started by a command for voice communication in the internet; and a telephone

5   set control unit for detecting depressed push-buttons in the ten-key unit, obtaining the connection point data from the accumulating unit, sending out dial data and connection point data via the public network, starting the voice codec when the dialed side has been connected

10   to the internet service provider network and, upon arrival of a call, retrieving for the connection point data of the calling side, effecting connection of the own side to the internet service provider network by retrieving and referring to the accumulating unit

15   according to the connection point data and informing the calling side of the connection.

Each telephone set further comprises an enciphering unit for permitting exchange of connection point data in terms of ciphers.

20   According to a fourth aspect of the present invention, there is provided an internet communication method comprising steps of: in response to provision, by a calling telephone set as an internet service provider network subscriber, of connection point data for making

25   internet service telephone communication to a called telephone set via a public network, the called telephone set receiving the connection point data connects itself to an internet service provider network on the basis of

the connection point data, and then the calling telephone
set connects itself to the internet service provider
network.

According to a fifth aspect of the present
5   invention, there is provided an internet communication
method comprising steps of: in response to provision,
by a calling telephone set as an internet service provider
network subscriber, of connection point data for making
internet service telephone communication to a called
10   telephone set via a public network, the called telephone
set receiving the connection point data connects itself
to an internet service provider network on the basis of
the connection point data, and then the calling telephone
set connects itself to the internet service provider
15   networkm, the connection point data including at least
an IP address in the internet service provider network
and the telephone number of a point to be connected to
the internet service provider network.

According to a sixth aspect of the present
20   invention, there is provided an internet communication
method comprising steps of: in response to provision,
by a calling telephone set as an internet service provider
network subscriber, of connection point data for making
internet service telephone communication to a called
25   telephone set via a public network, the called telephone
set receiving the connection point data connects itself
to an internet service provider network on the basis of
the connection point data, and then the calling telephone

6

set connects itself to the internet service provider network, the connection point data including at least an IP address in the internet service provider network and the telephone number of a point to be connected to

5   the internet service provider network, a push-button telephone set having various function keys being provided between each of the plurality of telephone sets and the public network with a function of sending out a call from each telephone set.

10   In the present invention, in order to guarantee the service quality, an ablet (i.e., execution module having one time log-in identifier, pass word and dial-up and opposite side address data) is provided, which sends out, to the opposite side of communication, a means for

15   permitting the opposite side to call back in internet service telephone communication to the VPN (virtual private network) of its own subscribed provider.

According to the present invention, in addition to the feature of cheap communication fee of internet

20   service telephone communication, internet service telephone communication is permitted by guaranteeing the sound quality, i.e., service quality as the service of the VPN of the own subscribed provider.

Other objects and features will be clarified from

25   the following description with reference to attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a construction of an embodiment of the

telephone communication system according to the present
invention;

Fig. 2 is a construction of another embodiment of
the telephone communication system according to the
present invention;

Fig. 3 is a view showing the realization of the
telephone set according to the present invention on a
personal computer; and

Fig. 4 is a view showing a telephone set according
to the present invention, in which an encryption unit
is additionally provided.

PREFERRED EMBODIMENTS OF THE INVENTION

Preferred embodiments of the present invention
will now be described with reference to the drawings.

An embodiment of the present invention will now be
described with reference to Fig. 1. The Figure shows the
construction of the embodiment of the telephone
communication system according to the present invention.

As shown in Fig. 1, telephone sets 100 and 120
according to the present invention can make telephone
communication via a public line and bypass the line for
internet service telephone communication in a simple
procedure.

The telephone sets 100 and 120 are connected to
lines 110 and 140, respectively, which can be
interconnected via a public network 150 or an internet
service provider network 160. The public network 150
includes LAN, general public network and mobile

8

communication network.

The telephone sets 100 and 120 comprise ten-key units 101 and 121, display units 102 and 122, telephone set control units 103 and 123, "H323" voice codecs 104

5   and 124, accumulating units 105 and 125, line interface units 106 and 126 and data modem units 107 and 127, respectively.

The ten-key units 101 and 121 each have keys of numerals "0" to "9" and marks "*" and "#" and other

10   function keys, and can notify telephone number and bypassing and also make other notifications. The display units 102 and 122 each can display call arrival notification and results of processing in the own telephone set. The units 101 and 121 each have a

15   bypassing notification push-button 109 for commanding the start of internet service telephone communication.

The telephone set control units 103 and 123 each send out dial data when detecting the depressed push-buttons in each of the ten-key units 101 and 121.

20   When detecting bypassing, the units 103 and 123 each obtain data for bypassing line for internet service from each of the accumulating units 105 and 125, and send out the dial data and connection point data to each of the line interface units 106 and 126. When obtaining caller

25   identifier and subaddress signal from each of the data modem units 107 and 127 upon call arrial, the units 103 and 123 each notify internet telephone call arrival by obtaining the data from each of the accumulating units

9

105 and 125, and start internet service telephone communication.

Upon receipt of command from each of the telephone set control unit 103 and 123, the "H323" voice codecs
5   104 and 124 are each started, whereby the lines 110 and 140 are interconnected for internet service voice communication. In the accumulating units 105 and 125, telephone number and access identifier data representing the internet service connection point to be connected
10   by the called side and that to be connected by the calling side are stored, respectively.

The line interface units 106 and 126 each receiving dial data from each of the telephone set control units 103 and 123, make a call to the public network and the
15   internet service provider network via each of the data modem units 107 and 127, and when detecting the call arrival from the public network, they each serve as voice and data communication interface. The units 106 and 126 each transmit subaddress signal, which is obtained by
20   adding caller identifier to internet service connection point data, via each of the data modem units 107 and 127.

The data modem units 107 and 127 each relay communication between the line and each of the line interface units 106 and 126, analyze the caller
25   identifier detected in each of the line interface units 106 and 126, and send out the analyzed caller identifier to each of the telephone set control units 103 and 123.

The operation of this embodiment of the present

invention will now be described. In this embodiment, it
is assumed that the telephone set 120 is the transmitting
side, and the other telephone set 100 is the receiving
side.

5   The calling person on the side of the telephone set
120 makes dialing by operating dial push-buttons in the
ten-key unit 121. Specifically, the calling person
depresses the bypassing notification push-button 109,
and then dials the telephone number of the called side.

10   Detecting the key operation in the ten-key unit 121,
the telephone set control unit 123 controls the line
interface 126 for sending out the dial number of the
called side. Detecting the depression of the bypassing
notification push-button 109, the unit 123 retrieves the

15   accumulating unit 125 to call out the telephone number
and access identifier as the connection point data to
be connected by the called side for internet service
telephone communication. The telephone set control unit
123 notifies the called-out connection point data to the

20   line interface unit 126.

The line interface unit 126 sends out the
connection point data notified by the telephone set
control unit 123 as subaddress signal obtained by adding
the caller identifier to the called side dial number via

25   the data modem unit 127.

Detecting the call arrival in the line interface
unit 106, the telephone set 100 analyzes the caller
identifier in the data modem unit 107. The line

11

interface unit 106 notifies the call arrival and the caller identifier data to the telephone set control unit 103.

The telephone set control unit 103 compares the

5 caller identifier received from the line interface unit 106 and the data from the accumulating unit 105 to check whether the numeral figure of a predetermined connection point data format and that of the subaddress signal with the caller identifier are identical. When it is proved

10 as a result of the check that the two numeral figures are identical, the telephone set control unit 103 causes the accumulating unit 105 to preserve the connection point data and also causes the display unit 105 to display the arrival of the internet service telephone

15 communication request. The display unit 102 displays the notification of the arrival of the internet service telephone communication request.

In response to the request arrival notification, the called person depresses an internet service

20 telephone communication start push-button in the ten-key unit 101. Detecting the depression of the internet service telephone communication start push-button in the ten-key unit 101, the telephone set control unit 103 calls out the connection point data, having been sent out from

25 the calling person side, from the accumulating unit 105, and commands transmission to the dial number in the connection point data, thus effecting connection to the access point line.

12

The telephone set control unit 103 sends out verification of identifer with access point via the data modem unit 107 according to the connection point data. After completion of the verification of identifier with

5   access point, the telephone set control unit 103 starts the "H323" voice codec 104 as internet service voice codec. In this way, the telephone set 100 is connected to the line 110 (i.e., VPN of the internet service provider network 160).

10   In the telephone set 120, the telephone set control unit 123 detects the connection point data send-out verification from the line interface unit 126, obtains preliminarily registered internet service connection point data of the telephone set 120 from the accumulating

15   unit 127, and dials the connection point via the line interface unit 126.

The telephone set control unit 123 sends out the verification of identifier with access point via the data modem unit 127 according to the connection point data.

20   After completion of the verification of identifier with access point, the telephone set control unit 123 starts the "H323" codec as internet voice codec, thus connecting the telephone set 120 to the line 140 (i.e., VPN of the internet service provider network 160).

25   The data which are provided in the connection point data, are not limited to the telephone number to be dialed up by the opposite side set and the identifier code at that access point, but the connection point data may also

13

include other internet service telephone communication data, such as nickname as the internet service telephone set, main address, IP address and gate keeper data.

Where the telephone number or the like is obvious
5   and need not be sent out, such data may be left out. Also, the caller identifier is by no means limitative as the data to be added to the connection point data; for example, it is possible to add ISDN D-channel bucket or user-to-user data or, in case of "H323" telephone service
10   defined by ITU-T, add as electronic mail or data terminal file.

Furthermore, the present invention is applicable not only to the connection to an internet service network managed by a provider but also to internet service
15   telephone sets in self-managing network WAN or in-premise AN. The present invention is further applicable not only to internet service telephone sets but also meeting telephone sets utilizing an internet service line or television meeting sets.

20   As has been shown, the telephone sets 100 and 120 according to the present invention can make internet service telephone communication between them with the connection of their "H323" codecs 104 and 124 to VPN of the internet service provider network 160. That is, the
25   telephone set 120 (i.e., the calling side) permits connection of the telephone set 100 (i.e., the called side) having no contract regarding VPN subscribed by it thereto by first connecting itself thereto and then

14

sending out contract data to the telephone set 100. In
this way, the calling and called sides can make mutual
internet service telephone communication without
contract with any common provider but by utilizing a
5   single provider on a quality-guaranteed internet service
line (such as VPN line or Qos guarantee line).

In this way, the present invention permits high
speech quality internet service telephone communication.
Also, the telephone set according to the present
10   invention can preclude contract expenditure increase due
to a plurality of provider contracts effected by a
plurality of opposite side telephone sets and burden
increase in view of expeditures and operation steps of
management and maintenance due to the plurality of
15   contracts.

A different embodiment of the present invention
will now be described with reference to Fig. 2. Fig. 2
shows the different embodiment of the telephone set
according to the present invention. The preceding
20   embodiment of the telephone set is an internet service
telephone set as independent telephone set.

In this embodiment, as shown in Fig. 2, push-button
telephone sets 111 and 141 are connected to telephone
sets 100 and 120, respectively. The telephone sets 111
25   and 141 are to be connected via lines 110 and 140,
respectively, to a public network 150 and an internet
service provider network 160. The telephone sets 111 and
141 are not limited to independent telephone sets or

15

in-premise switching system terminals; for example, they may be constructed as switching system. Furthermore, the telephone sets 111 and 141 are not limited to analog telephone sets; for example, they may be ITU-T "H323"

5   terminals, ISDN terminals, telephone sets for cable modems and so forth.

Figs. 3 and 4 will now be referred to. Fig. 3 is a view showing the realization of the telephone set according to the present invention on a personal computer.

10 Fig. 4 is a view showing a telephone set according to the present invention, in which an encryption unit is additionally provided.

The telephone set according to the present invention is not limited to an exclusive communication

15 unit. As shown in Fig. 3, it is possible to realize as the telephone set on a personal computer. In Fig. 3, it is shown that it is displayed on a personal computer display screen that connection point data has been received. The user of the personal computer realizes the

20 internet service telephone set with a microphone 171 and a loud-speaker 172 of a PC unit 170 by selecting icon with a mouth and dialing up the designated access point. The icon on the personal computer may be displayed in a browser in a receiving side personal computer, or it

25 may be on a transmitting side web page.

The data on the web may not only be mere dial data of the access point and identifier for verification, but may also be data of ablet type (i.e., execution type)

16

such as JAVA ablet accompanied by a telephone call producing operation. Aside from the JAVA ablet, the data may be of execution type via standard API in a data terminal. Files of the execution type via the standard

5 AP1 are not limited to operations in the browser. In execution type on the PC unit 170, it is possible to provide the convenience that the communication is obtainable with the sole click operation of the icon.

In the telephone set shown in Fig. 4, an encyphering

10 unit 108 is provided for sending out the caller identifier and telephone number. With the encyphering unit 180, it is possible that the opposite side of communication or the third party is unable to understand or recognize the sent-out data. It is also possible to prohibit re-uses

15 of the transmission data by encyphering . It is further possible to permit one time right to be maintained until the establishment of communication, so that re-transmission is possible at the time of failure of communication.

20 In this embodiment, the terminal of internet service telephone communication is constituted by a telephone set and a personal computer. The terminal may also be IVR (Interfactive Voice Response unit), facsimile data server, voice recognition dialer or voice

25 mail.

In an embodiment with an IVR, a voice message such as "where to connect ?" is given upon reception of a call arrival notification. By giving a command to such a

message, an internet service connection is made for communication. A facsimile data server can make a call to, for instance, a personal computer, and connect itself to an internet network for communication to obtain

5 catalogue or like data. A voice recognition dialer or a voice mail can also be used likewise. Furthermore, it is possible to make a communication by the internet connection by the terminal with the inteligence function.

10 With the telephone set according to the present invention, the calling side can make internet service telephone communication with the called side with good service quality guaranteed by the internet service provider so long as it is subscribed thereto. The

15 calling side need not be subscribed to the same provider.

In other words, the calling and called sides may be subscribers of different internet service providers, and internet service telephone communication with a plurality of terminals as opposite side of communication

20 may be made without need of concluding contracts with the providers subscribed by the respective terminals. This means that it is possible to preclude contract expenditure increase due to contracts with a plurality of providers subscribed by respective terminals as

25 opposite side of communication and also burden increase in the expenditures and steps of management and maintenance due to the plurality of contracts.

Furthermore, since the calling side internet

18

service provider is utilized, the communication can be made without need of striding between different providers, and thus the service quality (i.e., Qos and packet delay) can be readily guaranteed.

5   Moreover, in the type of execution on personal computer, communication can be made conveniently by merely click operating the icon.

Changes in construction will occur to those skilled in the art and various apparently different modifications 10 and embodiments may be made without departing from the scope of the present invention. The matter set forth in the foregoing description and accompanying drawings is offered by way of illustration only. It is therefore intended that the foregoing description be regarded as 15 illustrative rather than limiting.